

What is claimed is:

- 1 1. A computer-implemented method of initializing a simulation comprising:
2 accessing an attribute on a simulation model; and
3 responsive to the attribute, conditionally treating an unknown state of an
4 input node on the simulation model as a known state.
- 1 2. The computer-implemented method of claim 1 wherein conditionally treating
2 an unknown state comprises:
3 when the attribute is set, evaluating an output node of the simulation model
4 using the known state for the input node rather than the unknown state.
- 1 3. The computer-implemented method of claim 2 wherein evaluating an output
2 node comprises detecting an X on the input node, and evaluating the output node as
3 if a 0 was on the input node.
- 1 4. The computer-implemented method of claim 3 wherein the simulation model
2 is a model of an inverter, and evaluating an output node comprises detecting an X on
3 the input node, and evaluating the output node to a 1.
- 1 5. The computer-implemented method of claim 2 wherein evaluating an output
2 node comprises detecting an X on the input node, and evaluating the output node as
3 if a 1 was on the input node.
- 1 6. The computer-implemented method of claim 5 wherein the simulation model
2 is a switch-level model of a transistor, and evaluating an output node comprises
3 detecting an X on a gate node of the switch-level model of the transistor, and
4 logically closing the switch-level model of the transistor.

1 7. A computer-implemented method of evaluating an output node of a device
2 model comprising:
3 determining whether an input node of the device model has an unknown
4 value assigned thereto; and
5 responsive to an attribute on the device model, if the input node has an
6 unknown value, conditionally evaluating the output node as if the input node had a
7 known value.

1 8. The computer-implemented method of claim 7 wherein the attribute has at
2 least two valid states comprising a first state signifying that the unknown value should
3 be propagated to the output node, and a second state signifying that the unknown
4 state should be treated as a known state, and wherein conditionally evaluating
5 comprises:
6 when the attribute is in the first state and the input node has an unknown
7 value, propagating the unknown value to the output node.

1 9. The computer-implemented method of claim 8 further comprising:
2 when the attribute is in the second state and the input node has an unknown
3 value, evaluating the output node as if the input node had a known value thereon.

1 10. The computer-implemented method of claim 7 wherein the method is
2 performed within a three value simulator that represents node values by a two bit
3 word, and wherein evaluating the output node comprises:
4 inverting one bit of the two bit word representing the unknown value on the
5 input node to create a temporary two bit word; and
6 evaluating the output node using the temporary two bit word as the input
7 node value.

1 11. A computer-implemented method of simulating a self-resetting circuit, the
2 method comprising:

3 detecting the presence of an X value on a node within the self-resetting
4 circuit;
5 accessing an attribute on a device model that represents a device within the
6 self-resetting circuit, wherein the node having the X value is an input node of the
7 device; and
8 when the attribute is set, simulating the self-resetting circuit as if the node
9 had a non-X value.

1 12. The computer-implemented method of claim 11 wherein simulating the self-
2 resetting circuit as if the node had a non-X value comprises simulating the self-
3 resetting circuit as if the node had a value of zero.

1 13. The computer-implemented method of claim 12 wherein the device
2 comprises an inverter, and simulating comprises evaluating an output node of the
3 inverter to a value of one.

1 14. The computer-implemented method of claim 11 wherein the X value is
2 represented by a two bit word, and simulating the self-resetting circuit as if the node
3 had a non-X value comprises inverting at least one bit of the two bit word.

1 15. The computer-implemented method of claim 14 wherein the device model
2 represents a first inverter in an inverter chain, and simulating the self-resetting circuit
3 further comprises exchanging the values of the bits in the two bit word to create a
4 two bit word that represents the value of an output node of the device model.

1 16. An article having a computer readable medium, the computer readable
2 medium having instructions stored thereon for performing a method of initializing a
3 device model in a simulation, the method comprising:
4 accessing an attribute of the device model to ascertain a state of the attribute;
5 and

6 responsive to the state of the attribute, conditionally treating an X on an input
7 node of the device model as a value other than an X.

1 17. The article of claim 16 wherein the attribute is associated with the input node,
2 the method further comprising:

3 accessing a second attribute of the device model, the second attribute being
4 associated with a second input node; and

5 responsive to a state of the second attribute, conditionally treating an X on the
6 second input node as a value other than an X.

1 18. The article of claim 16 wherein conditionally treating comprises:

2 conditionally treating an X on any input node of the device model as a value
3 other than an X.

1 19. The article of claim 16 wherein the device model is a model of an inverter,
2 the simulation is a switch-level simulation, and conditionally treating comprises:

3 when the attribute is set and an X is present on an input node to the model of
4 the inverter, evaluating an output node of the model of the inverter to a 1.

1 20. The article of claim 16 wherein the device model is a model of an inverter,
2 the simulation is a switch-level simulation, and conditionally treating comprises:

3 when the attribute is set and an X is present on an input node to the model of
4 the inverter, evaluating an output node of the model of the inverter to a 0.

1 21. An article having a computer readable medium, the computer readable
2 medium comprising a data structure describing a device model for use in a simulator,
3 the data structure comprising an attribute to signify whether an X on an input node of
4 the device model should be treated as a value other than X during a simulation.

1 22. The article of claim 21 wherein the attribute is associated with the device
2 model such that the attribute is a single attribute configured to affect a simulator's
3 behavior relative to all input nodes of the device model.

1 23. The article of claim 21 wherein the attribute is associated with the input node
2 of the device model such that the attribute is configured to affect a simulator's
3 behavior relative to only the input node to which the attribute is associated.

1 24. The article of claim 23 wherein the data structure further comprises a second
2 attribute associated with a second input node of the device model, the second
3 attribute being configured to signify whether an X on the second input node of the
4 device model is to be treated a value other than X during simulation.

1 25. The article of claim 21 wherein the device model represents an inverter, and
2 the device model is configured to be used in a switch-level simulator.